UNIVERSITI TEKNOLOGI MARA

A PILOT DIGITAL MAMMOGRAPHY DATABASE ESTABLISHMENT AND ENTRANCE SKIN EXPOSURE EVALUATION

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of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of the UniversitiTeknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other institution or non-academic institution for any other degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

A digital mammography database is important for image storage, retrieval and teaching purposes. An attempt is made to establish a pilot digital mammography image database to be used together with computed assisted diagnosis (CADG) software for early breast cancer detection in Malaysia. The main objective of this study is to establish a pilot digital mammography image database system. A total of 736 images of patients undergoing digital mammography examination were collected. All of the images were loaded into the database using the MATLAB platform. The ESE between digital and conventional mammography was also measured. ESE was obtained by using thermoluminescent dosimeter (TLD), ionization chamber and the mammography phantom RMI 156. The exposure factors for each patient in digital mammography were recorded. The same procedures were then simulated by phantom study for both conventional and digital mammography. The exposure parameters and ESE measurements from conventional and digital systems were compared using independent *t*-test. The results showed no significant difference for comparisons of ESE values of conventional and digital mammography and ESE values of mediolateral oblique (MLO) and craniocaudal (CC) views. A significant difference was resulted from comparison of ESE, mAs and kVp of different breast density. The important contents of the proposed database system were identified which comprised of patient file, report file, mammography report, Breast Imaging Reporting and Data System (BIRADS), mammography images, dose and additional screening. The proposed database can be improved by using other database software. Further study should be carried out by including a large sample size for the ESE measurement.

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CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

This chapter provides some definitions that are relevant with this study. Explanation of the database, digital mammography database, mammography, digital mammography image, mammography image views, mammography reporting system, radiation dose in mammography and entrance skin exposure (ESE) will provide in understanding the problems which guides to the implementation and objectives of this study.